

## Longevity gene regulates neural stem cells in mice

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Researchers at the Stanford University School of Medicine have found that a gene long-known to regulate the lifespan of tiny roundworms also plays a role in regulating neural stem cells in mice.

Variations of the gene family, called FoxO, help roundworms live to an unusually ripe old age in the lab, and mutations in the FoxO3 gene have also recently been associated with long life in Japanese, German, American and Italian populations. Laboratory mice lacking FoxO3 live to about half their usual age of 30 months before dying of cancer.

The group found that in addition to dying young, adult mice lacking FoxO3 had fewer neural stem cells than normal mice of the same age. These neural stem cells normally generate new brain cells as needed, and also replenish their own population to maintain a lifetime pool of cells.

According to a press release by the Stanford University School of Medicine:

“ The researchers also discovered that the few stem cells found in the adult mice without FoxO3 more rapidly churned out neural cell precursors - those cells destined to become new neurons - than did the mice with normal FoxO3 levels. In fact, the brains of the mice that lacked FoxO3 were heavier than the control group, perhaps because they were burning through their pool of neural stem cells by making too many new nerve cells.

A better understanding of how neural stem cells maintain the brain as it ages could help those researchers who are developing therapies for disorders such as Alzheimer's and Parkinson's disease or stroke.

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